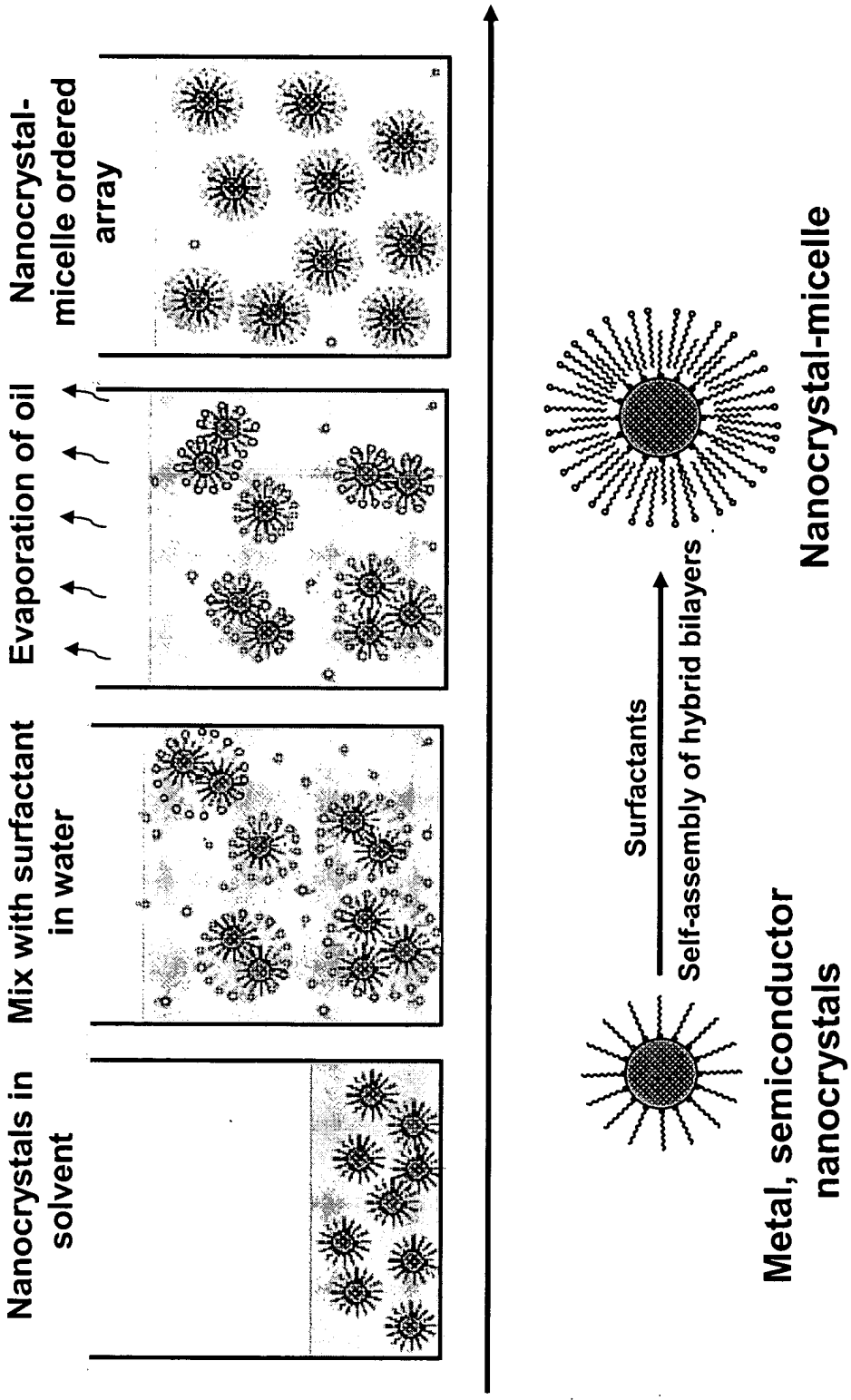
Nanocrystals in solvent
Mix with surfactant in water
Evaporation of oil
Nanocrystal-micelle ordered array
Metal, semiconductor nanocrystals
Surfactants
Self-assembly of hybrid bilayers
Nanocrystal-micelle

FIG. 1

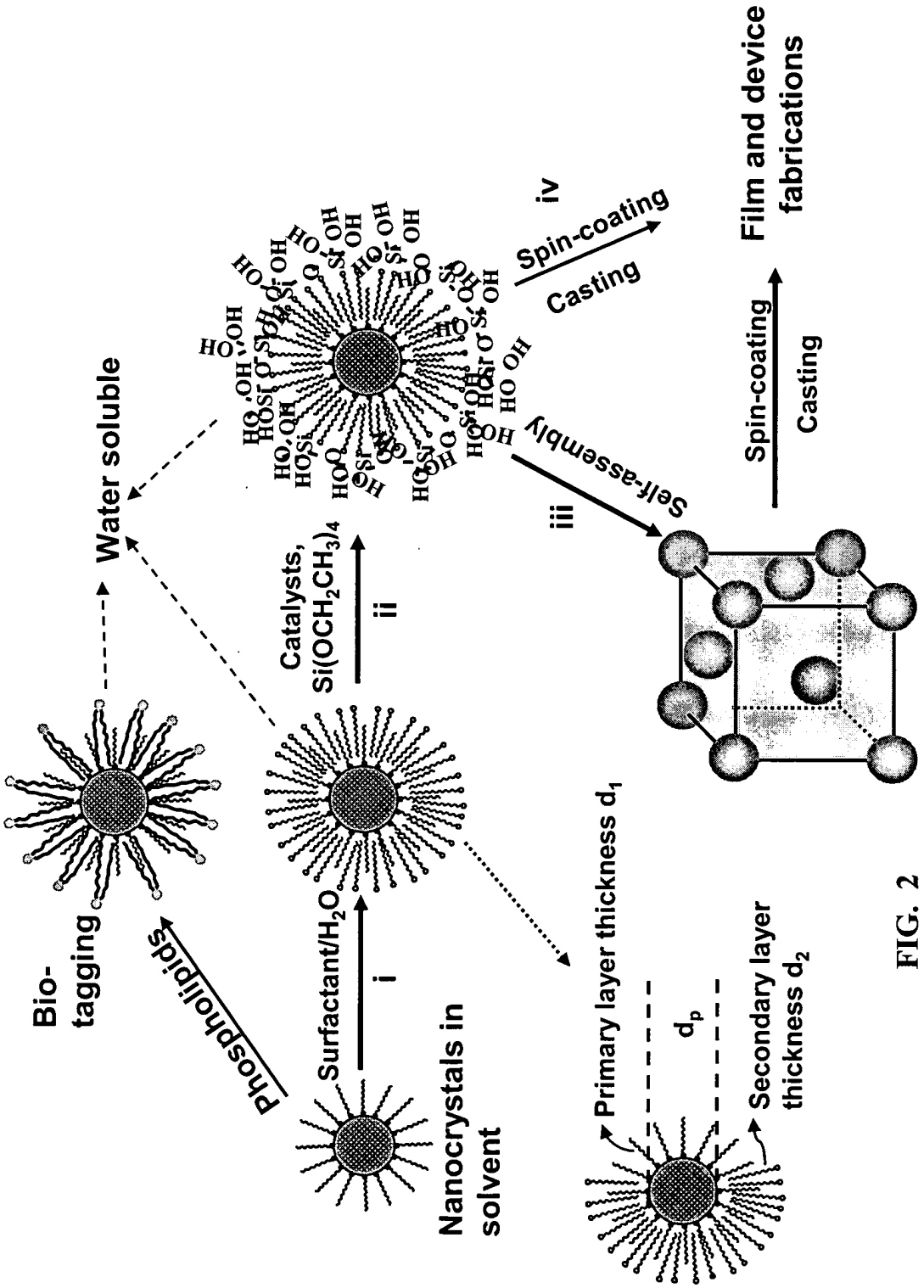
Nanocrystals in solvent
Surfactant/H_2O
i
Catalysts, $Si(OCH_2CH_3)_4$
ii
Self-assembly
iii
Spin-coating
Casting
iv
Film and device fabrications
Spin-coating
Casting
Water soluble
Bio-tagging
Phospholipids
Primary layer thickness d_1
d_p
Secondary layer thickness d_2

FIG. 2

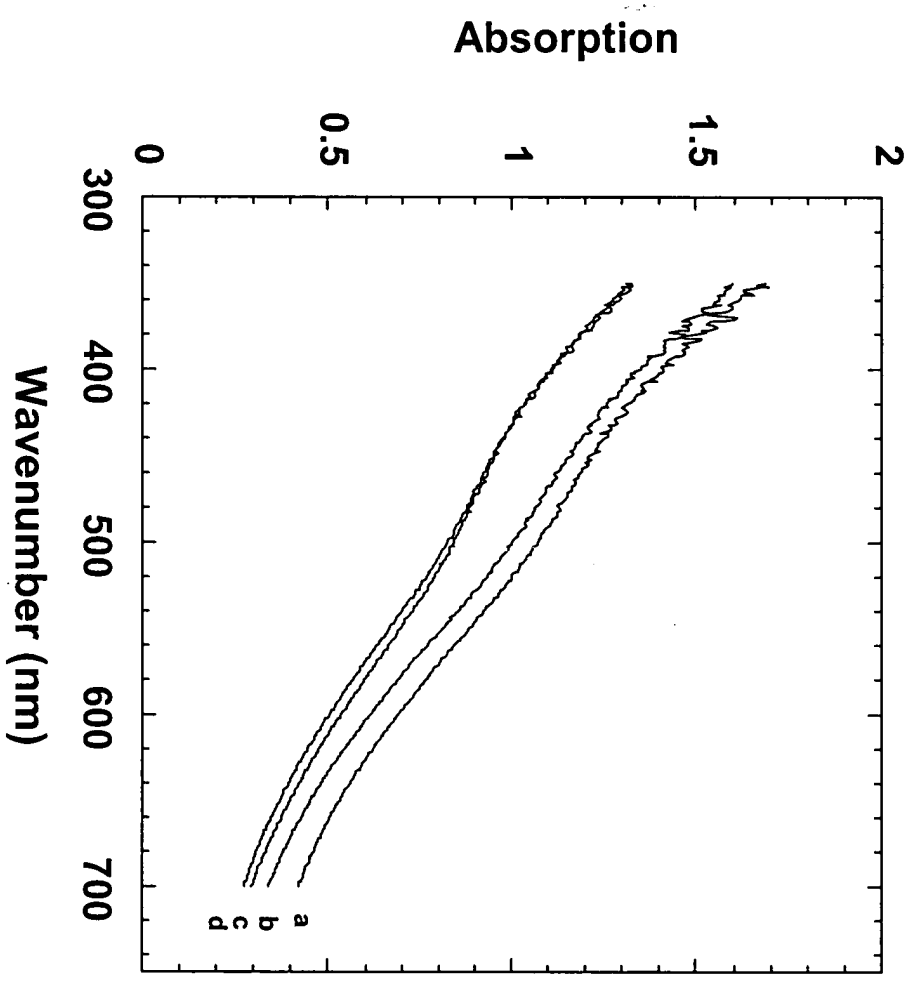

FIG. 3

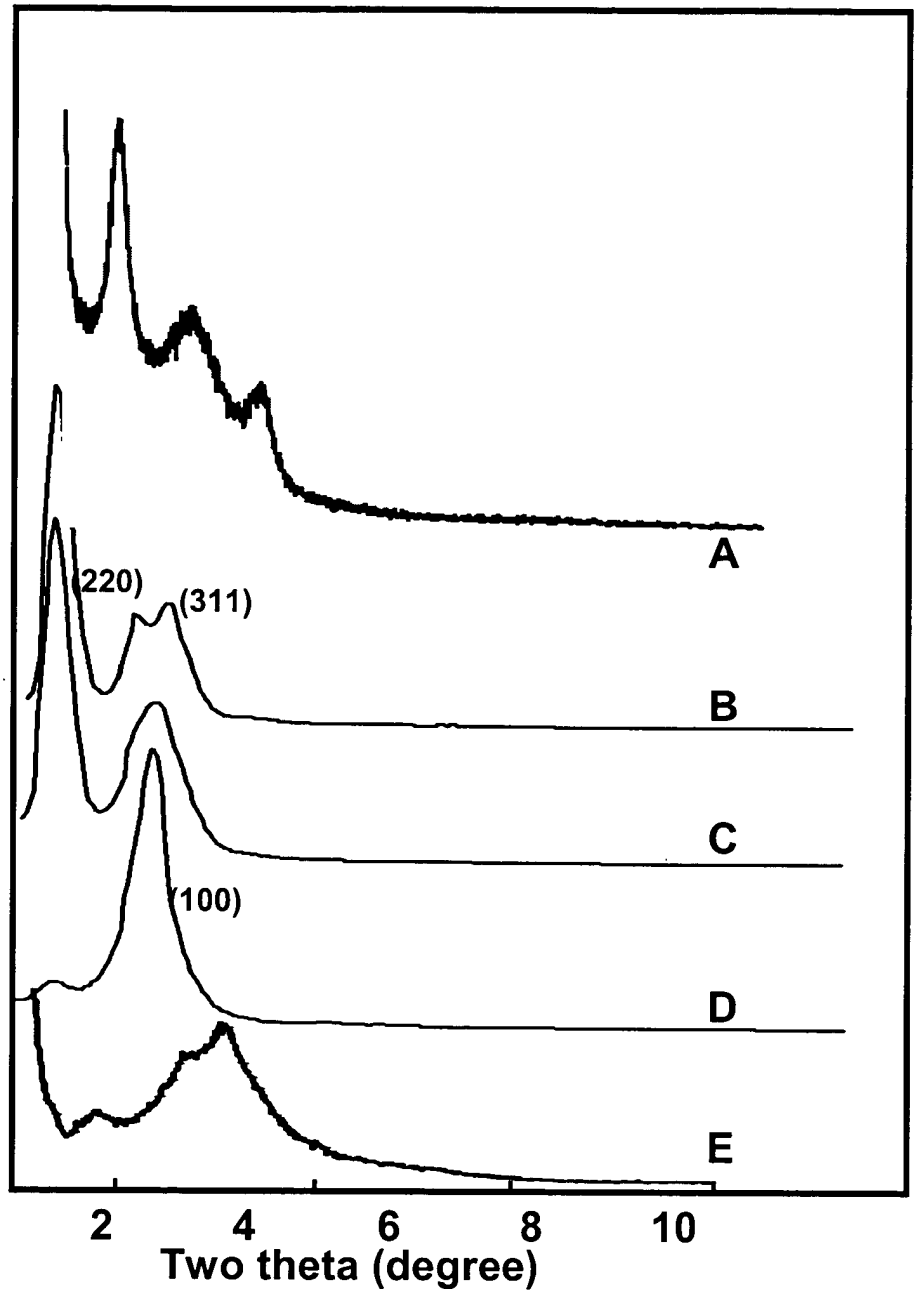

FIG. 4

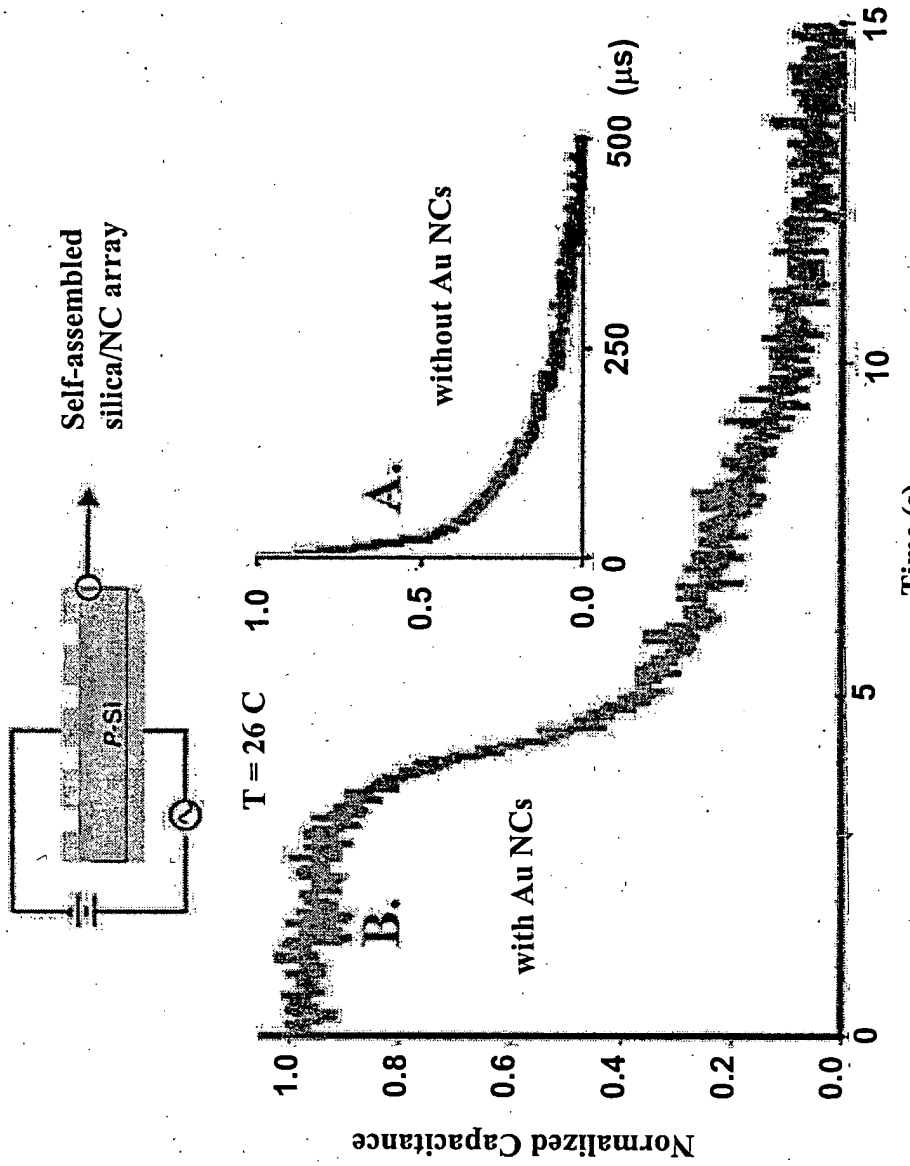
Self-assembled
silica/NC array
P-Si
T = 26 C
A.
without Au NCs
B.
with Au NCs
Normalized Capacitance
Time (s)
(μs)
0.0
0.2
0.4
0.6
0.8
1.0
0
5
10
15
0.0
0.5
1.0
0
250
500

FIG. 5